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June 2019

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INVESTING IN THE FUTURE

Chicago is digging in
on infrastructure
upgrades and building
a foundation
for growth

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Commissioner Randy Conner
Chicago Department
of Water Management
Chicago, Illinois

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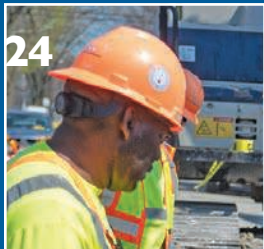
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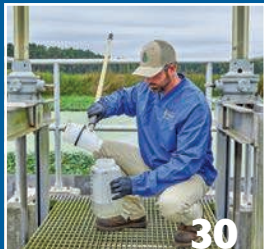
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ON THE COVER: Randy Conner, commissioner of the Chicago Department of Water Management, visits a worksite where a crew was installing a new 24-inch sewer main. (Photography by Rob Hart)



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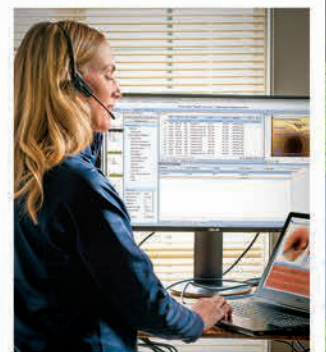
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THE CLOCK IS TICKING

Our infrastructure needs attention, and waiting only makes it worse



FROM THE EDITOR

Luke Laggis

Do you ever wish you had a crystal ball to glimpse the future of your utility and ensure you're making the right decisions?

There's no way to know what the future holds. There's no way to guarantee you're making the right decisions. You have to consider all the information you have at that given point in time and make the best possible decisions based on that information.

Of course, making the right decisions for your utility would be considerably easier if cost wasn't a factor. Weighing that cost, however, often comes down to what's less expensive today versus what's fiscally advantageous over the long run. Making spot repairs is cheaper than replacing or rehabilitating pipes, but when you consider long-term costs and factor in added maintenance, inflow and infiltration, leaks, emergency repairs, water loss, etc., are you saving money or just kicking the can down the road?

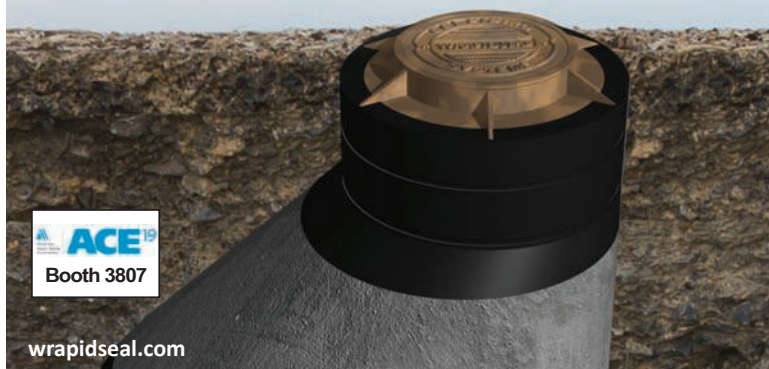


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This debate is nothing new. You probably struggle with it on a daily basis. And when the water is still flowing to your city council members' homes and wastewater whisks away with every flush, it's hard to convince them you need millions of dollars for system upgrades, especially if there's a cheaper temporary fix.

I see story after story about the deteriorating state of not only water and wastewater, but all U.S. infrastructure. I don't understand it. It should be the easiest thing to sell. It's a critical piece of everything we do.

I think it speaks to a greater problem in this country. The ethos has changed. Supporting the common good, building a stronger future, thinking about tomorrow instead of today have fallen away to self-interest and personal benefit. It's not something you can control, but you have to fight it, at least when it comes to your utilities.

The website www.watermainbreakclock.com provides a jarring look at the cost of failing water infrastructure. Much of the content on the site touts the lower break rates of PVC versus other pipe materials, as well as its corrosion resistance. The site is in fact tied to the Uni-Bell PVC Pipe Association, but the "clock" portion at the top of the page provides running figures for the number of broken water mains since 2000, along with the number of broken mains that day and running totals for water main repair costs and total corrosion costs.



Watching the speed at which the numbers climb is jarring. Regardless of whether you think PVC is the answer to your water main problems, looking at the numbers, you can't help but think there has to be a better way than the same old practices that generate these numbers. Doing things the same way just because that's how they've always been done isn't cutting it.

I'm not using this space to recommend one material or technology over another, but this site is a good reminder that the same old approach that's more or less been used for a century isn't solving these persistent problems. Look at the water main break clock. Do you want to be contributing to those numbers or slowing them down?

We all know the answer to that.

Enjoy this month's issue. ♦

Comments on this column or about any article in this publication may be directed to editor Luke Laggis, 800-257-7222; editor@mswmag.com.

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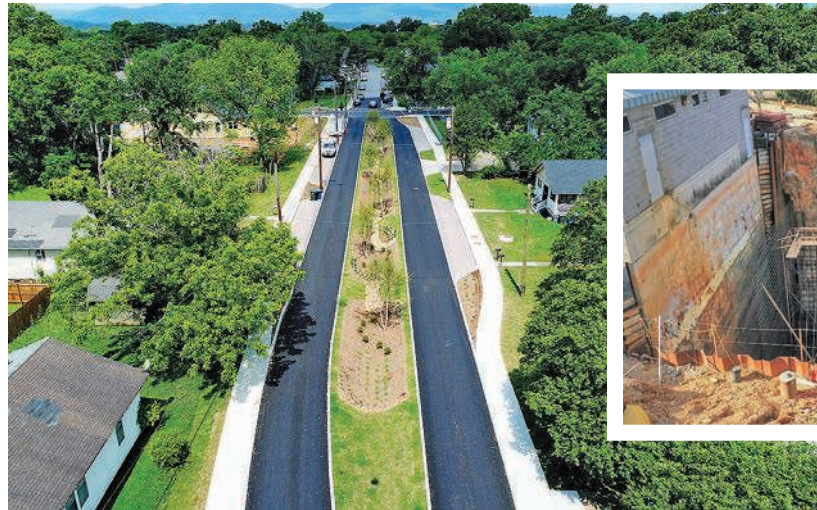
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CLEAR CHATTANOOGA

Rebranding a Consent Decree

The wastewater infrastructure system in Chattanooga, Tennessee, is undergoing a massive makeover, mostly in an effort to boost the system's ability to handle a high volume of stormwater and waste-



water during heavy rain events. The city is also committed to using natural resources as the foundations for revitalizing its downtown.

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A UNIQUE PROGRAM

Madison's Unidirectional Flushing

Every spring, Madison (Wisconsin) Water Utility crews set out to clear mineral sediment from 900 miles of water main. They spend months moving from neighborhood to neighborhood, opening up more than 2,500 fire hydrants to flush iron and manganese out of the city's water pipes, often using a unidirectional flushing method. mswmag.com/featured



PHILLY'S GREENED ACRES

Alleviating CSO Burden

A significant problem for many municipalities is combined sewer overflows. Now, imagine the scale of the problem when your streams are your sewers. That's the issue the Philadelphia Water Department is dealing with today. In this online exclusive article, read about how the utility overcomes some of its challenges through civic and community engagement. mswmag.com/featured



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UNDERGROUND



DELIVERING THE BEST

Boston's award-winning Water and Sewer Commission focuses on education and environmental protection while surpassing service standards

By Trude Witham

You won't find a treatment plant at the Boston Water and Sewer Commission. You will find a highly dedicated operations team that serves more than a million people.

Some 450 team members maintain 1,000 miles of water pipes and 1,500 miles of stormwater and drainage lines. They are responsible for maintenance and emergency repairs to the water and sewer mains, service connections, hydrants and drains.

Their success comes from ongoing training and capital improvements. They are strongly committed to education and environmental protection. Sustainability is a priority, and so is maintaining

Boston Water and Sewer Commission contractors Sam Capela, Heath Capela and Larry Coudo (from left) work on replacing an old water main in Boston. (Photography by Scott Eisen)



PROFILE: Boston Water and Sewer Commission

FOUNDED:
1977

POPULATION SERVED:
1.2 million

SERVICE AREA:
City of Boston

EMPLOYEES:
300

SOURCE WATER:
Supplied by the Massachusetts Water Resources Authority

DISTRIBUTION:
1,000 miles of water pipe, 1,500 miles of sewer pipe

KEY CHALLENGE:
Rain events, stormwater management

WEBSITE:
www.bwsc.org/home/home.asp

“When the commission was formed in 1977, the pipes were in bad shape. Since then, our capital improvement program has rehabilitated 95% of the water system infrastructure, by a process of cleaning and cement lining.”

John Sullivan

predictable rates. Challenges include rain events and stormwater management, along with a pipe replacement program.

The commission has received awards for drinking water quality and for sustainable operations and community outreach. These include an Outstanding Performance Award for drinking water from the Massachusetts Department of Environmental Protection in 2017.

In 2018, the commission received a Sustainable Water Utility Management Award from the Association of Metropolitan Water Agencies. That award recognized improving operations, maintaining fiscal responsibility and increasing public awareness to improve water quality and protect the environment.

Taking control

The commission was established in 1977 to maintain and improve the quality and reliability of water, sewer and stormwater services in the city of Boston. Governed by a three-member board, the commission's main goals are efficient delivery of service, cost control and environmental protection.

The potable water distribution system serves 670,000 residents and 600,000 daily commuters in Boston's 48 square miles. Treated water comes from

the Massachusetts Water Resources Authority through 29 metered connections at various delivery points. Raw water is drawn from the Quabbin and Wachusett reservoirs and the Ware River.

The Operations Department handles the maintenance and operability of the water, sewerage and drainage infrastructures. Team members perform preventive maintenance and emergency repairs to water mains, service pipes, hydrants, gates, valves, catch basins, manholes, sewers and storm lines. They also maintain the materials and equipment inventory, fleet vehicles, buildings and properties, and administer the cross-connection control and grease trap inspection programs.

Overseeing all this is John Sullivan, chief engineer, who has been with the commission since the beginning. “The cast iron pipes date back to 1848,” he says. “When the commission was formed in 1977, the pipes were in bad shape. Since then, our capital improvement program has rehabilitated 95% of the water system infrastructure, by a process of cleaning and cement lining.”

Aggressive leak detection/repair and progressive metering programs continue to reduce unbilled and unaccounted-for water. The commission initiated several meter programs, switching to smaller meters and installing smart meters (Aclara).



**John Sullivan, chief engineer
of the Boston Water
and Sewer Commission,
in his office in Boston.**



A section of failed pipe sits on the road during a water main replacement project in downtown Boston.

“We know that our guys will jump in a hole full of water when it’s freezing outside and it’s the day before Christmas. That shows all the commitment I need to see.”

John Sullivan

toward the cost of replacement, and the ability to pay interest-free over 48 months.”

IMMEDIATE RESPONSE

At the Boston Water and Sewer Commission, leak detection teams have played a major role in greatly reducing unaccounted-for water. Leak detection has also helped prevent potential paralysis of busy areas and essential services in the city.

In November 2017, a commission leak detection team responded to reports of water entering a Massachusetts Bay Transportation Authority vent. Led from headquarters by Roodly Dorleans, manager of field engineering, leak detection and dye testing, the team went to work.

They surveyed the area, a busy street near City Hall, with a real-time digital leak noise correlator (DigiCorr from Itron) and quickly identified a compromised 16-inch water main. A dig crew immediately excavated, found the leak and replaced rotting bolts that secured a coupling.

If that water main had given way, the shopping district known as Downtown Crossing, and the area’s two major Massachusetts Bay Transportation Authority routes, would have been severely affected.

Going beyond

Besides the awards mentioned earlier, the commission has won others, including:

2018 National Environmental Achievement award for operations and environmental performance, and the National Association of Clean Water Agencies 2017 STAR L (Systems Taking Action to Reduce Lead) award from the state DEP.

The commission also won the 2017 New England’s Best Drinking Water Taste Test competition held by the New England Water Works Association. It was ranked highest in customer satisfaction in the Northeast by J.D. Power in its 2018 water utility residential customer satisfaction study.

Sullivan believes the commission won these awards for doing better than the standards. “DEP looks at performance and whether you have any violations,” he says. “They look at your cross-connection programs and whether you protect public health. We survey buildings to make sure no one is changing the plumbing. Our leak detection program has reduced leaks to 8%. It used to be 50%.”

The commission has replaced all lead pipes in its public water mains. “We do more than is required,” Sullivan says. “The STAR L award acknowledged our collaboration with the city’s public schools and our efforts in the community to protect children from the dangers of lead.”

The lead replacement incentive program encourages property owners to replace lead water services. “We give them a credit up to \$2,000

Dedicated team

Of the commission’s 450 team members, 206 work in operations, including water and sewer and support people. Most laborer positions are equipment operator, service repair and service repair foreman. “Some specialize in water or sewer, but they all have to take training classes in both and they are able to work on both if a situation requires it,” Sullivan says.

Sullivan has 46 years in the industry and certifications in water treatment and distribution. “My father retired as chief engineer at the commission after 40 years, and my grandfather before him retired after 52 years as division engineer,” he says. “I have replaced pipes that my grandfather put in.”

As chief engineer, Sullivan oversees 90 people and all consultants. He reports to Henry Vitale, commission executive director. Reporting to Sullivan is Paul Canavan, director of operations, who has been with the commission for 22 years and oversees four superintendents. He holds Grade 4 water distribution and Grade 2 water treatment licenses.

Sullivan credits the staff with keeping customers happy: “Our customers expect a lot. Every customer has unusual conditions and needs, and every problem is different. Our people have to face that situation, so empathy is important. We have some remarkable people who do a great job.”

The commission believes in employee recognition. Each quarter, an All-Star Award goes to a team member. Employees may nominate a co-worker;

a call for nominations is sent by email and is posted on three digital signs around the facilities. The executive director chooses the winner. Award criteria includes creative problem-solving skills, enthusiasm, commitment to teamwork, and resourcefulness.

"Most people love their jobs here," Sullivan says. "We know our guys will jump in a hole full of water when it's freezing outside and it's the day before Christmas. That shows all the commitment I need to see."

Continual upgrades

Sullivan feels the commission's greatest achievement is keeping rates low by planning for improvements and spreading the costs out over time. "We take care of business in the most cost-effective manner possible. That allows us to keep rate increases under 5%. We have very few people showing up at our rate meetings."

The greatest challenges are rain events and dealing with stormwater. "During a small rain event, we drain to the ocean," Sullivan says. "For extreme events, our emergency preparedness plan ensures that we have the right personnel and equipment available."

The staff checks storm drains in low-lying areas to make sure they are free of debris and free-flowing. There are flap gates in flood-prone neighborhoods. Tide gates are inspected monthly, regardless of weather.

Pipe replacement is an ongoing challenge. "We have televised every sewer pipe, so we know what shape they are in," Sullivan says. "We continually need to upgrade; it's a never-ending program. It's the same with the water pipes. Even though our leak detection program has dramatically reduced leaks, it's like a weight-loss program — you have to keep after it or it comes back."

Public education

The commission is deeply involved in education. A full-time education coordinator, Adriana Cillo, presents daily to classrooms, senior housing residents and community groups. She also leads youth and adult volunteers in a citywide storm drain stenciling program. Participants mark storm drains with decals that remind residents that the drain leads to a waterway.

The commission works with river associations and makes grants available that help them educate the public. The commission also partners with the Massachusetts Water Resources Authority on

community education.

The commission's water truck is another community service. "It allows us to distribute our tap water to Boston residents and visitors attending events and walking through the city," Sullivan says. The truck has six taps for filling water bottles, four drinking fountains and two doggy bowls.

The truck is featured at community events and social functions: "It's especially good in warm weather since the water is chilled. In fact, we are the only source of freshwater at the Esplanade on July 4, where people are sitting out in the heat waiting for the Boston Symphony to perform."

"Even though our leak detection program has dramatically reduced leaks, it's like a weight-loss program — you have to keep after it or it comes back."

John Sullivan

Sullivan sees a bright future for the commission but sees a challenge in climate change. "We know we will get bad storms from which we will have to recover in 24 hours and get right back to normal. But I'm confident that we will make it." ♦



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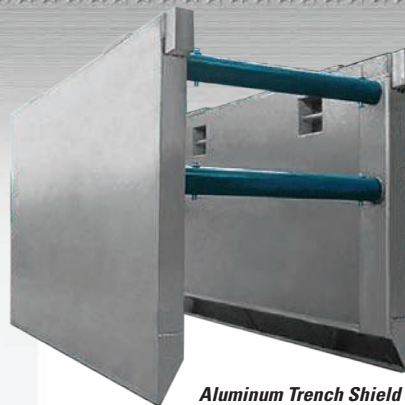
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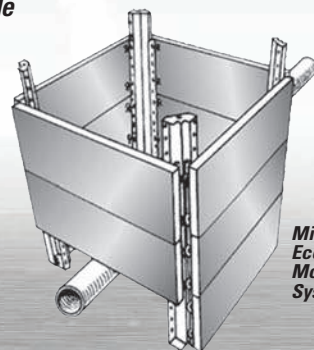
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DEVELOPING THE WORKFORCE

YH20 mentoring participants sample water from a Baltimore-area stream.



Participants in the 2018 YH20 program visit the Patapsco Wastewater Treatment Plant.

A Baltimore initiative recruits unemployed and underemployed young people and trains them for water and wastewater careers

By Sandra Buettner

Upon seeing seasoned workers leave for retirement and take many years of institutional knowledge with them, Rudolph S. Chow, P.E., met with department and industry colleagues and came up with a way to address the problem.

At the same time, Baltimore was experiencing widespread underemployment among young people, and city officials wanted to help address that, as well. Chow, director of public works, partnered with the Mayor's Office of Employment Development and the Chesapeake Water Environment Association. After eight months, they had developed a three-phase program known as YH20, piloted in 2015.

Chow wanted to target younger workers and get them interested in the water industry as they started their careers. He felt that group would benefit the most from career guidance and support and would help replace the experienced workers leaving the industry.

Targeting millennials

"Baby boomers are very loyal to the companies they work for, but the millennials are slightly different; they like to move around," Chow says. "I feel it's our responsibility to keep them motivated and help them to continually learn. That includes grooming them for other roles within the utility.

"With more than 3,000 employees, our department is very large, so they can move up and advance and it's like going to a new job for them. In this way, we can keep them and their knowledge here, creating a new generation of workers to fill the roles of the retirees."

The city has 1.8 million residential and business water and wastewater customers, and these roles in the Department of Public Works include jobs in wastewater, water, solid waste and energy. Applicants for the YH20 program, ages of 18-24, must have a high school degree or GED and be either unemployed or underemployed. Registration runs from mid-December through early January, and participants are chosen in February.

Structured training

Out of about 70 applicants, 20 are typically chosen for each class. In the first phase of the six-month program, held at the Mayor's Office of Employment Development, participants complete a skill and interest assessment and take part in basic job-readiness training, which covers topics including attendance, dress and resume preparation.

In the second phase, participants explore a variety of career options in the water industry through the Mayor's Office of Employment Development. They take part in job shadowing that includes work site tours at the wastewater



The YH2O class of 2017 celebrated completion of the program with City of Baltimore representatives and water industry supporters. Front row, seated left to right: Jason Perkins-Cohen, Mayor's Office of Employment Development director; Rudolph S. Chow, P.E., Department of Public Works director; then-Mayor Catherine E. Pugh; Bernard C. "Jack" Young, City Council president; and Anthony Greene, internship coordinator in the Mayor's Office of Employment Development Youth Services Division.

"I feel it's our responsibility to keep them motivated and help them to continually learn. That includes grooming them for other roles within the utility."

Rudolph S. Chow, P.E.

A set of twin brothers took part; one left a full-time retail position after taking the classes because he saw better career potential in the water industry. Both brothers work in the Department of Public Works and were recently promoted to utility installer II.



YH2O participant Darrius Pugh delivers remarks at the 2015 closing ceremony to celebrate the completion of the inaugural class of the water mentoring program.

Impressive results

To date, 41 young people have completed the program and all are still employed with the Department of Public Works. Positions they have filled include water operation technician apprentice, maintenance technician, customer service, lab assistant and public works inspector trainee.

According to Jennifer Combs, Department of Public Works public relations officer, "We have received great feedback from the participants. For some, the program gives them structure and inspiration to return to college for jobs in the environment or other areas. Some who complete the program and are parents like the stability of a full-time, well-paying job with a promising future."

treatment and water filtration plants. They are paired with a career coach from the Department of Public Works and Chesapeake Water Environment Association to learn about roles and opportunities.

In the third and final phase, participants are placed in paid summer jobs at the Department of Public Works through the Mayor's Office of Employment Development's YouthWorks program and start interviewing for full-time positions at the plants. The YH2O workers are then placed in areas of the Department of Public Works Bureau of Water and Wastewater. Most stay in those positions for a long term before advancing to other roles.

Awards and recognition

The Department of Public Works recently received a Public Communication & Outreach Program Award for YH2O from the Water Environment Federation. In addition, NASSCO awarded scholarships to seven graduates from the 2015 and 2016 programs. The scholarships, for pipeline inspection certification training, were valued at \$800.

Recognizing the success of YH2O, the leaders of Charlotte (North Carolina) Water and a group of Washington, D.C., government representatives recently visited Baltimore to seek advice on establishing similar mentoring programs. ♦

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ROLE REVERSAL

Managing people you used to work with side by side poses unique challenges — here's how to ease the transition

By Ken Wysocky

We invite readers to offer ideas for this regular column, designed to help municipal and utility managers deal with day-to-day people issues like motivation, team building, recognition and interpersonal relationships. Feel free to share your secrets for building and maintaining a cohesive, productive team. Or ask a question about a specific issue on which you would like advice. Call editor Luke Laggis at 800-257-7222, or email editor@mswmag.com.

Most managers face a daily gauntlet of brush fires. But the tightrope walk tentatively trod by newly promoted managers, who suddenly find themselves supervising the same colleagues with whom they toiled side by side and enjoyed cocktails after work, is especially fraught with challenges.

Maybe it's resentment from a colleague or colleagues who also applied for the same position and are supremely confident they could do the job better. Or the realization that you're no longer getting invited out for lunch or for post-work drinks and gossip.

Whatever the case, the dynamics of your relationships with these team members has been irrevocably altered; few things shift the balance of workplace relationships more than gaining the power to fire friends. And suddenly, the meaning of the old it's-lonely-at-the-top cliché true and clear.

The new pecking order will undoubtedly feel awkward — both for you and your direct reports. It's not easy to strike that delicate balance between fairly asserting your newfound authority and still remaining on

friendly terms with friends who you probably commiserated and kibitzed with about workplace issues.

But experts note that you can employ specific strategies to help everyone on the team feel as comfortable with the "new normal" as possible. And if you act with quiet confidence and poise (after all, someone higher up believes you have the skills to do the job!), you can establish credibility without undermining yourself or ruining perfectly good relationships.

One-on-ones

One of the first things you should do is hold face-to-face meetings with each of your direct reports. Everyone must be included, lest you appear to be playing favorites with colleagues who already are close friends. As you talk, it's important to clear the air about any possible resentments or other negative emotions. If they're mad about being

passed over for the job, let them know you still value their skills and will be a strong advocate for their professional development.

During the meeting, be sure to practice good, active listening skills (there's a reason you have two ears and only one mouth). Let angry employees vent; often times, all they want is an opportunity to be heard, which helps them let go of whatever animosity or uncertainty they might feel about the situation.

During these meetings, you can build credibility and respect by diplomatically asking them about what they perceive as your weaknesses. If nothing else, this shows you're willing to accept input; the last thing you want to do is come off as the newly-minted-yet-all-knowing manager. Also, ask them where they'd like to have more support and the kind of career path they envision.

Moreover, if you've worked with your new direct reports for a while, by now you have a pretty good idea about their strengths and weaknesses. That will help you provide them with training to shore up those weaknesses and delegate some responsibilities that play to their strengths. All this contributes to establishing you as a credible and empathetic leader who's concerned about your employees' development.

Follow the individual meetings with a team meeting, where you can present your vision for the team, your approach to leadership and your expectations going forward, preferably in short brushstrokes — less is more here. And be sure to explain how all those things align with corporate goals. This meeting also presents a great opportunity to present some of the ideas gleaned from the one-on-one meetings (give credit where credit is due, of course).

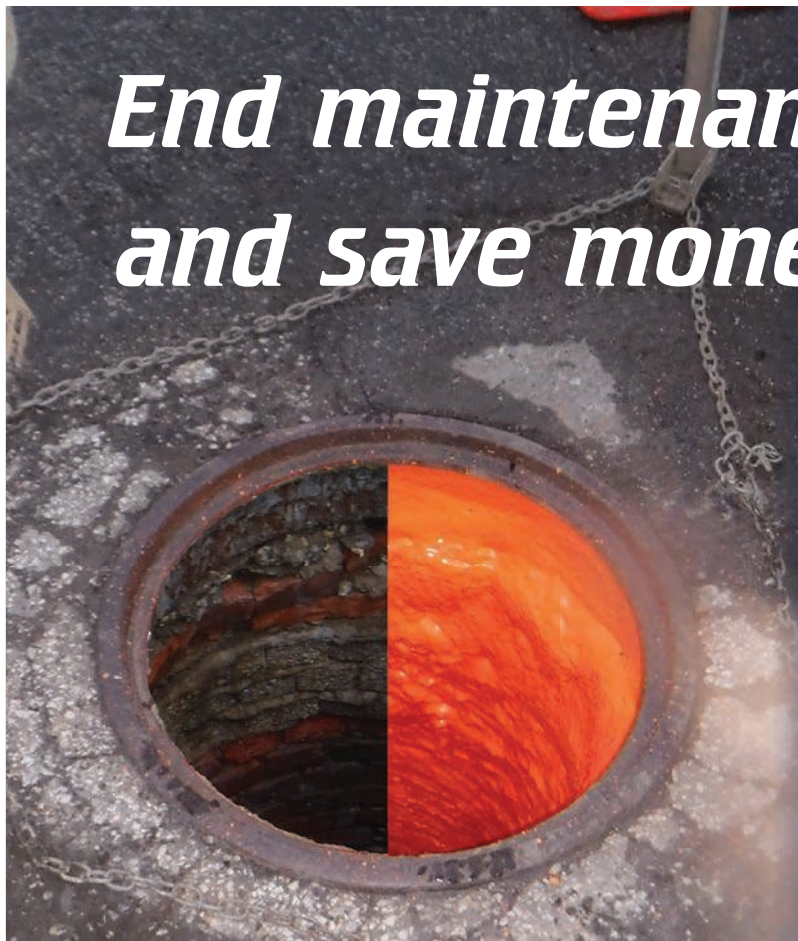
Take it slow

As a former worker bee, you undoubtedly have developed some strong ideas about changes you'd like to make. But resist the temptation to make your mark with dramatic shifts in procedures and policies. Moving too fast, as well as not asking for input, are two sure ways to turn people off and undermine your credibility.

Moreover, there's always a chance that a disgruntled employee who was passed over for the position won't be able to let it go. Perhaps they'll test you by bringing up old issues that have already been resolved. Or talking about you behind your back. Or making irreverent

Moving too fast, as well as not asking for input, are two sure ways to turn people off and undermine your credibility.

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remarks during meetings.

The key here is quick action — don't allow things to fester. Hold another one-on-one meeting and tell the employee what you've observed and how it affects team dynamics. Then pull their feet closer to the fire and ask them what's provoking these actions and what it will take to stop them. It's not a bad thing to make them feel even a little bit uncomfortable here, as long as you're as fair as you are candid. Asking them for a solution only helps promote buy-in on their part, after all is said and done.

As for socializing with people who now are your direct reports, it's important to draw a line. Unfortunately, it's very difficult — as well as unwise — to be both a buddy and a supervisor. At the very least, continuing to spend more time with certain employees creates the perception of favoritism, which can taint even what you firmly believe are fair decisions about things. At worst, it can make things very uncomfortable if the need arises for disciplinary action.

Perception is everything

The bottom line: You still can — and should — treat people with warmth and respect. But if you're going to be social, be equally social with everyone. And if a close friend has trouble dealing with new line drawn in the sand, talk about it.

As you grow into the new role, don't hesitate to lean on previous managers for advice. And it never hurts to take a step back and contemplate what you liked and didn't like about those managers and use that knowledge to forge your own path and develop your own leadership style.

In the end, there's no magic button you can push to ease that awkward transition from team member to team leader. But employing these strategies just might make those initial steps on that tightrope a little bit easier. ♦

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FOCUS: WATER

INVESTING IN THE FUTURE

Chicago is digging in on infrastructure upgrades and building a foundation for growth

By Jim Force

"The capital plan is a huge investment in Chicago's future. It creates a foundation for our future growth, attracting new business and expanding our regional water distribution services."

Randy Conner



Chicago Department of Water Management workers install 24-inch concrete pipe on a sewer main replacement project at 82nd and Morgan in Chicago. (Photography by Rob Hart)

The City of Big Shoulders is also the City of Big Water.

Chicago's Department of Water Management is capable of producing 2.1 billion gallons of potable water per day, serving 490,000 accounts and 5.3 million customers throughout Chicago and 125 neighboring suburbs. That's over 40% of the population of the entire state of Illinois.

The department is responsible for over 4,000 miles of water mains, 48,500 fire hydrants and two of the largest water treatment plants in the world.

And the capital improvement plans and programs for this vast system are just as big. The department is in the midst of a 10-year campaign that includes replacing aging distribution lines and installing new water meters throughout the customer base.

Total cost of these improvements is estimated at \$6 billion when the plan is completed.

"The capital plan is a huge investment in Chicago's future," says Randy Conner, Department of Water Management commissioner. "It creates a foundation for our future growth, attracting new business and expanding our regional water distribution services."

Lake Michigan water

Chicago's source water is Lake Michigan, which borders the city along a 45-mile-long shoreline. Two intake cribs are located 2 miles offshore, and freshwater is pumped from these structures



PROFILE:

Chicago Department of Water Management

ESTABLISHED:
1889

RESPONSIBILITIES:
Water intake, treatment and distribution

CUSTOMERS SERVED:
Approximately 5.3 million (490,000 accounts)

AREA SERVED:
City of Chicago, plus 125 suburbs

SOURCE WATER:
Lake Michigan

WATER SYSTEM:
Two offshore intake cribs, 12 pumping stations, Jardine water treatment plant (1.44 billion gallons a day), Sawyer water treatment plant (0.72 bgd), 4,300 miles water mains, 48,500 hydrants

AVERAGE DAILY PRODUCED WATER:
Approximately 1 billion

STAFF:
Randy Conner, commissioner; Julie Hernandez Tomlin, first deputy commissioner; Marisol Santiago, managing deputy commissioner; William Cheaks, managing deputy commissioner

ANNUAL OPERATIONS BUDGET:
1.1 billion annually

WEBSITE:
www.chicago.gov/water

“We have been able to save money and increase the mileage of new pipe by grouping projects in specific areas of the city and by leaving some of the old pipe in the ground and disconnecting it rather than trying to remove it.”

Randy Conner

to either the Jardine treatment plant (rated at 1.44 billion gallons a day) or the Sawyer treatment plant (rated at 0.72 bgd).

The treatment scheme at both locations is the same: Raw water is chlorinated and fluoridated, and alum and polymer are added as the water flows into rapid mix tanks. Solids are flocculated and settled, and the water is filtered before final disinfection with chlorine. A phosphate blend is added to line pipes and prevent corrosion.

A series of 12 pumping stations move the water through the distribution system to customer sites. Some of the pumping stations are being converted to green processes; more efficient electricity is replacing steam as the main power source, with green roofs, solar panels to produce supplemental power and permeable landscaping also being

added. Total savings from these changes are estimated at \$4.5 million annually.

The system operates on a pump-on-demand basis; there are no elevated storage tanks.

Capital improvement plan

The Department of Water Management's 10-year capital improvement plan aims to:

- Dramatically reduce the miles of old water mains, some of which date to the 1880s.
- Upgrade over 200,000 manually read water meters and add meters to unmetered accounts.
- Convert three of the 12 pumping stations to sustainable status.
- And investigate the potential to replace lead service lines throughout the city.

To help fund these improvements, the Chicago City Council, as well as the Department of Water Management's partners and constituencies, unanimously agreed to incremental water rate increases totaling 75% over a four-year period, 2012-16.

Water mains

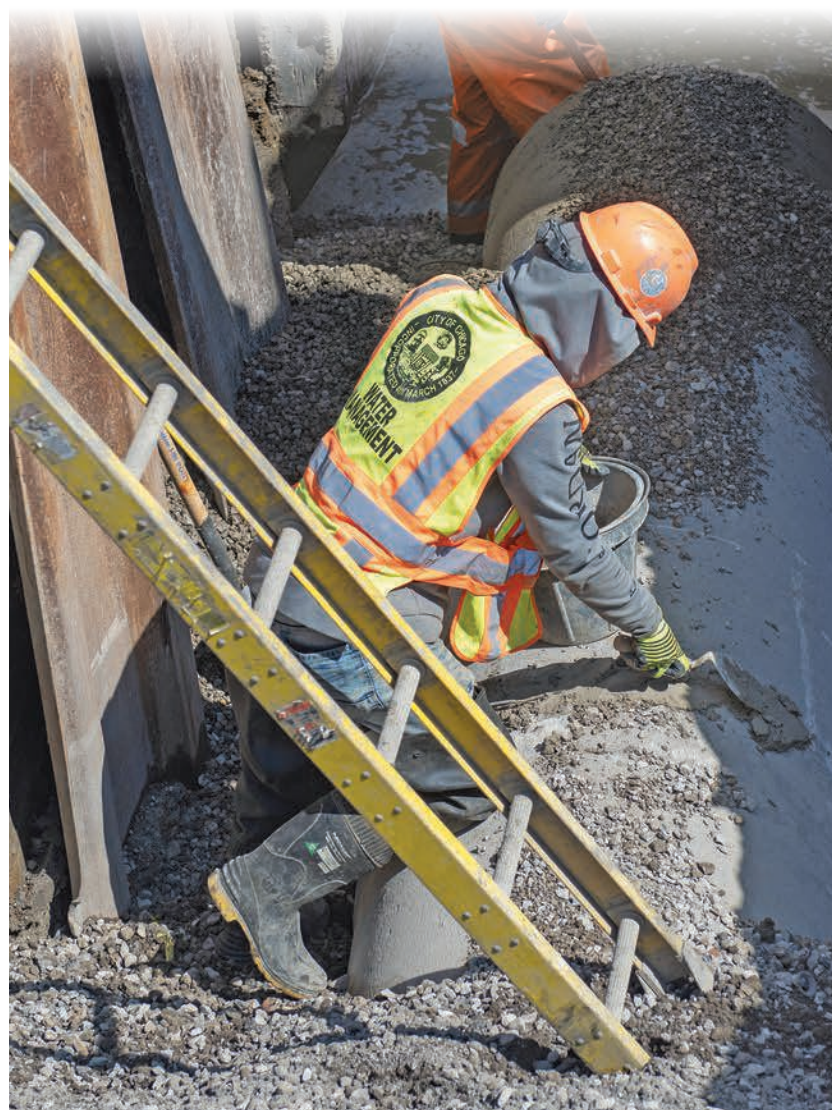
According to department data, over half of the city's water mains were installed in 1946 or earlier. The department began replacing them

in 2012. The goal has been to install at least 90 miles of new pipe each year since, and Conner says the installation rate has actually been increased because of efficiencies the department has developed over the period.

“Most of the old lines are ductile or cast iron — some reinforced concrete — although we've encountered some old wooden pipes, as well,” he says. “Average depth of excavation is 6 feet, and we're using crawlers and backhoes and open-trench construction throughout the replacement project. Most of the new lines are ductile iron.” Diameters range from 6 inches for feeder lines to 48 inches for larger distribution mains.

While the department focuses on areas where leaks have been detected using TriCorr ultrasonic devices (Fluid Conservation Systems) and unusually high or constant flow rates noted on customer meters, much of the replacement has been in conjunction with other infrastructure projects like street reconstruction or utility replacement.

“We've become more efficient at replacing water mains as we've gone along,” Conner says. “We have been able to save money and increase the mileage of new pipe by grouping projects in specific areas of the city and by leaving some of the old pipe in the ground and disconnecting it



Randy Conner, commissioner of the Chicago Department of Water Management, talks with workers on site at a sewer main replacement project.

An installation crew member seals a joint in a new 24-inch concrete sewer main.

rather than trying to remove it.”

The department uses in-house city employees for about 35% of the work — mainly the trenching — and outside contractors for the rest of the work including the connections.

Conner notes that the department goes the extra mile to keep affected customers informed of the work. He says it’s important to make sure the elected officials in a neighborhood know about the scheduled work ahead of time.

“We also send letters to property owners, put out informational flyers throughout the neighborhood and place notices in community newspapers.”

Conner adds that customers can also sign up to stay informed electronically, via email.

In sum, Chicago is well on pace to meet its target of reducing and replacing over 1,000 miles of its pre-World War II pipe by 2021.

Meters

Dr. Andrea Holthouse Putz, deputy commissioner, describes the city’s ambitious metering project.

“We had been using manual-read meters before, and although 80% of our revenue was metered, over 300,000 of our 490,000 accounts were nonmetered,” she says. Billing for non-metered accounts was estimated, based on the size of the building or house on the property and the number of occupants. Bills were sent every six months, in advance.

“All the nonmetered accounts are getting new Badger ORION AMR meters,” Holthouse Putz says. “These have 900 MHz transmitters that we can drive by and read from the street.” She says it’s “a huge change,” both for the city as well as customers. “They appreciate being able to see actual and accurate usage,” she says. “Plus, a red flag pops up if there’s a problem like a broken sewer or unusually high flow rate.”

A website (www.metersave.org) serves as a clearinghouse of information. The website describes how the new meters are available free to residents who own single-family houses and two-flats and are current on their bills. The program also guarantees that residential customers installing new meters will not pay more than they were before for seven years.

As part of the meter installation process, the department offers customers a free test for lead levels and a water pitcher and six water filters that are NSF-certified to remove lead if used correctly. If a home does test over the U.S. Environmental Protection Agency’s action level of 15 parts per billion for lead in drinking water, the department will also inspect a customer’s system and make a recommendation regarding lead abatement. Other features of the program include indoor and outdoor water conservation tips.

The department is 10 years into the replacement program and has installed approximately 130,000 new meters thus far.

Lead service lines

Like most of the older cities across the country, the Department of Water Management is investigating potential problems caused by lead service lines from the street to the customer’s site and lead plumbing inside the building.

“We actually started studying the issue before the crisis in Flint (Michigan),” Conner says.

The water produced by the department meets

“They appreciate being able to see actual and accurate usage. Plus, a red flag pops up if there’s a problem like a broken sewer or unusually high flow rate.”

Dr. Andrea Holthouse Putz

or better all federal and state regulations, and the city aggressively tests to ensure water quality. Both water treatment plants add a phosphate blend to coat pipes and prevent corrosion. Still, there is the possibility that lead service lines and

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Commissioner Randy Conner (center) and the crew installing the new sewer main at 82nd and Morgan in Chicago.

in-house plumbing could be leading to lead levels that exceed guidelines, particularly in homes built before 1986.

To that end, the department has commissioned a study by the firm of CDM Smith to evaluate the total cost and multiple factors involved in replacing lead service lines connecting water mains to homes.

“We’re doing the study to get a better understanding of what’s going on in the city, what are the technologies that might be employed, and the funding that might be available,” Conner says. Addressing this issue would make Chicago the largest city in the nation to explore a complete lead service line replacement program, and Conner

estimates that costs to remove lead lines could be \$4 to \$8 billion over multiple decades.

Conner says the study report should be available sometime this spring and will recommend one or two pilot studies the city can conduct to further understand any problems, as well as identify solutions, such as the feasibility of splitting costs with property owners 50-50.

Also, the department has launched what it describes as a first-of-its-kind study to determine the possible impact of water main construction and meter installation on water quality.

No comprehensive scientific study has previously explored the topic, the department states. “While the study is ongoing, preliminary data indicate the water main replacement program is not producing large changes in lead concentrations. As such, no changes are warranted to the city’s 10-year capital plan to replace century-old water mains and aging sewer mains that is in progress.” ♦

GREENING THE WATER INFRASTRUCTURE

The Chicago Department of Water Management may be big, but it’s also going green, and that includes the water distribution pump stations. Four of the stations are being converted from steam power to solar electric power to reduce CO2 emissions and save on operating expenses.

The Springfield Avenue pump station is a good example. The station is responsible for distributing 45-60 million gallons of water daily to local residents and businesses.

“The conversion is a great example of how we can incorporate sustainable solutions while saving money and creating more reliable infrastructure for our future,” says Randy Conner, water management commissioner.

The move is expected to save \$4.5 million in power costs annually and prevent the emission of 17,000 tons of carbon emissions.

In addition to the installation of solar panels manufactured by SolarWorld and the move away from steam power, the Springfield station features permeable pavers, an underground retention basin and green roof.

An additional 12,000 square feet of new park space for use by the community was created through the demolition of unused city property and further enhances the environmental benefits of the conversion. Conner says Department of Water Management expects the pumping station will receive silver LEED certification.

Similar conversions are planned for three more pumping stations as part of the city’s “Building a New Chicago” infrastructure improvement plan, initiated by former Mayor Rahm Emanuel.

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SAVING TIME AND WATER

Georgia water authority turns to automated flushing to improve efficiency

By John Edwards

“With inventory on hand, we can often preempt complaints by adding flushing units where usage is low and solve low chlorine residuals on the first fix.”

Adam Horton

A member of the Clayton County Water Authority collects water samples for monitoring. The utility has moved to an automated flushing system to improve water quality and boost efficiency.

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USER:

Clayton County, GA

Giving residents access to safe, clean drinking water can be one of the most capital-intensive and operationally significant services that a water utility provides.

With a distribution system that spreads over 1,500 miles and produces up to 42 million gallons of potable water per day, the Clayton County Water Authority — located just south of Atlanta — knows the value of automated flushing when it comes to maintaining water quality, minimizing water loss and keeping work crews productive rather than the expense of rolling another truck to manually flush.

A couple of years ago, Clayton County was experiencing low chlorine residuals in certain areas, even though they were spending many hours flushing water mains. This led to the purchase and installation of eight Hydro-Guard HG-2 automated flushing units that reduced 15 man-hours of weekly flushing down to 1 hour and 20 minutes and raised chlorine residuals to acceptable levels. Additionally, the installation reduced water use from 3,384,000 gallons per month with manual flushing to 933,300 gallons per month with automated flushing. That's a 72% monthly saving on nonrevenue water just from automating flushing practices.

The water authority does weekly chlorine residual testing, with increased frequency during the summer months when warmer temperatures allow for higher bacterial growth. Initially, these areas were being automatically flushed once a week, but then the water authority began to look at each zone on a case-by-case basis. This investigation resulted in fine-tuning the frequency and duration of flush, which is easy to do with Hydro-Guard automatic flushing units because it's a simple setting adjustment.

“Typically, we find that flushing more frequently and for shorter periods gets us the best water-quality results and uses the least amount of water,” says Adam Horton, distribution and resource coordinator for Clayton County Water Authority. Frequent flushing for Clayton County can be every other day for one hour.

The initial eight HG-2 units were calculated to have paid for themselves in five months. The results were impressive enough that the utility now keeps its own inventory of Hydro-Guard units at sampling sites. By keeping units in stock, they can quickly deal with water-quality changes



Clayton County now has 25 Hydro-Guard HG-2 automated flushing units, seen here from the bottom up, safeguarding its water quality 24 hours per day.

in their water distribution network that can give rise to dead-end lines or decreased chlorine residuals.

"With inventory on hand, we can often preempt complaints by adding flushing units where usage is low and solve low chlorine residuals on the first fix," Horton says.

Clayton County now has 25 Hydro-Guard HG-2 automated flushing units safeguarding the county's water quality 24 hours per day. Flushing is scheduled when demand is low, which results in less disruption to water customers and provides consistent, safe, clean drinking water. Most of the flushing units have been connected with meters on the downstream side, so the utility is able to get very accurate readings on water loss from flushing.

"It also gives us a safety net, as we can set alarms for unpredicted water loss," Horton says. "For example, if a battery needs to be replaced, it could result in the flushing system not shutting off."

"The Hydro-Guard units have been a blessing to Clayton County in more ways than one — we have improved water quality, with less water loss and require fewer man-hours to do the job." ♦

About the Author

John Edwards is a territory manager for Mueller Water Products.



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KNOW YOUR SOFTWARE

All PACP-certified programs should include import/export features

By Sheila Joy

If you are using the Pipeline Assessment and Certification Program for the condition assessment of your pipelines, it's important to be familiar with the PACP-certified software available to you, listed at www.nassco.org/certified-software.

One of the major benefits of PACP is the extremely wide availability of PACP-certified contractors, as well as PACP-certified software programs. An objective of maintaining standards pertaining to PACP is to allow the use of any PACP-certified software to collect data in the field, as long as the software used in the office is also PACP certified. This allows a contractor collecting data to use a PACP software program of his or her choice and enables that contractor to deliver the data in a standard export database file that can be imported into any PACP-certified software.

All PACP-certified software must include the import/export utility.

Unfortunately, software vendors sometimes sell software as "PACP certified" without this import and export capability or wrongly sell this capability separately at additional cost. Without this capability, you are not only forced to use their software, but contractors you hire for CCTV inspections are forced to as well. This may restrict the number of contractors that will bid on your project and requires many CCTV contractors to purchase and use new software that is unfamiliar to them. Ultimately, this can cost a

system owner more in the end. In order to protect your interests and continue to make PACP work for you, NASSCO is diligent in certifying software that meets these requirements.

If the PACP-certified software you are using does not include import and export capability, you are within your rights to require your software vendor to provide it at no additional charge. You should also feel free to notify NASSCO, and we will take steps to make sure the vendor is meeting its obligation to provide PACP import and export capability to all of its customers. This capability is a requirement of PACP software certification, but unfortunately a vendor can potentially show NASSCO it meets that capability during certification, then turn around and sell that same software without both import and export capabilities.

Your contracts should not require your PACP data to be delivered in a specific software format.

This restricts your contractors and raises prices, which is not the intent of PACP. We would therefore ask you to make sure your software, and the software used by your contractors, is truly PACP certified so contractors can deliver the data in the PACP format that has been established by NASSCO, allowing us all to work together to set standards for the proper assessment, maintenance and rehabilitation of underground infrastructure. ♦

NASSCO (National Association of Sewer Service Companies) is located at 2470 Longstone Lane, Suite M, Marriottsville, MD 21104; 410-442-7473; www.nassco.org

Sheila Joy is executive director of NASSCO. She can be reached at director@nassco.org.

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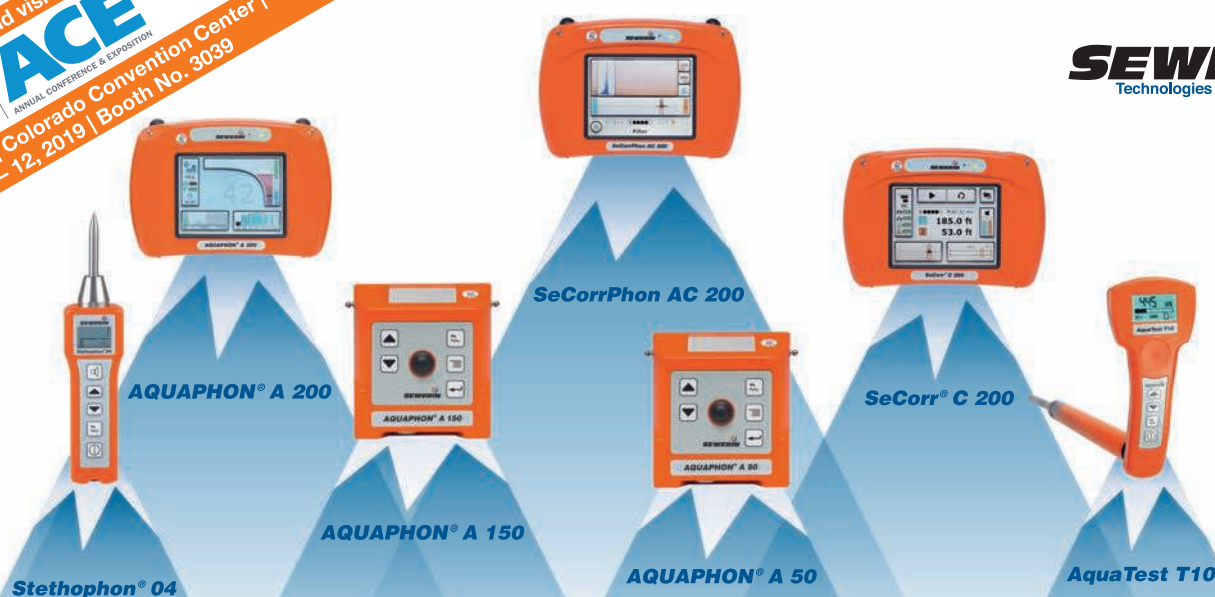
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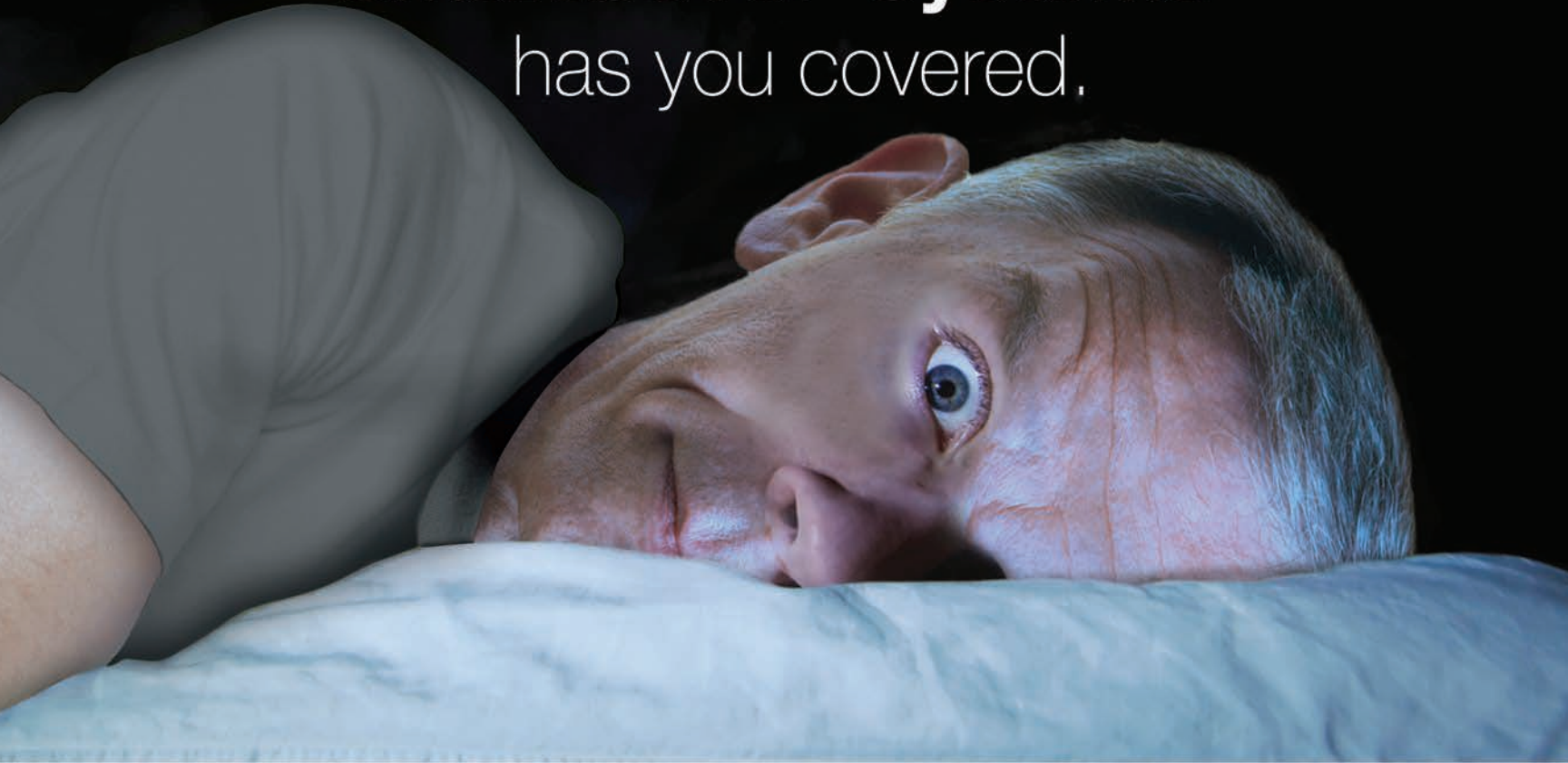


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MANHOLE EQUIPMENT AND REHABILITATION

By Craig Mandli



Aries Industries test and seal grouting system



CUES Easy Grout



Perma-Liner Industries Perma-Main Top Gun



Avanti International AV-254 Gelseal



Prime Resins PR10

APPLICATORS

Aries Industries test and seal grouting system

The test and seal grouting system from **Aries Industries** reduces setup time and provides efficient hands-on control to quickly seal leaking joints. Grout — pumped to a leaking joint — flows through the leak, sealing the surrounding soil to form an impenetrable barrier. Sixty-gallon tanks and continuous-duty mixers provide high volume to seal large voids. Reels for fast deployment and retrieval, as well as high-power winches, quickly move the packer from joint to joint for high productivity. The unit's 800 feet of color-coded hose allows long runs. The truck comes with a bench, storage and room to work. The operator tests and seals the joints while working in the control room, where test data and the sealing process are easily viewed, recorded and logged. **800-234-7205; www.ariesindustries.com.**

CUES Easy Grout

The **Easy Grout** computerized grouting system from **CUES** has a computerized graphical user interface that leads the user intuitively through the grouting process. The software includes help files, tool tip descriptions and recommended settings to assist operators. Since the system has been designed to consolidate all the valves, electrical controls, etc., into a single instrumentation cabinet, it can be mounted in any location, therefore saving office space. **800-327-7791; www.cuesinc.com.**

Perma-Liner Industries Perma-Main Top Gun

The **Perma-Main Top Gun** from **Perma-Liner Industries** is a manhole-to-manhole, continuous inversion lining system. It is specifically designed to rehabilitate 8- to 24-inch-diameter pipelines in only a few hours with no excavation or disruption in substrate. The liner is air-inverted through existing manholes and steam cured in as little as 90 minutes using compact 750,000 Btu dry steam generators. This minimizes repair time, road closures and reconstruction, and allows for safe reactivation of the repaired pipeline in

just hours. Because the system can be continuously fed, there is no limit to the length of material it can invert. Depending on the infrastructure, the installation lengths for liners typically average 300 to more than 600 feet. Prep time is minimal because all liner materials are premeasured and delivered to the repair location presaturated. **866-336-2568; www.perma-liner.com.**

CHEMICAL GROUTS

Avanti International AV-254 Gelseal

AV-254 Gelseal injection grout from **Avanti International** is a hydrophilic urethane gel with permeation properties when injected in water. It quickly permeates various soils and cures to create an effective, long-lasting water barrier while providing soil stabilization. It is designed to stop water infiltration in manholes, sanitary and storm sewer mainlines, pipe joints, service laterals and other underground structures by providing support and strengthening surrounding soils. Typical injection techniques are probe or curtain grouting and by remote packer. It is easy to handle, nontoxic and nonflammable. It is typically pumped at an 8-1 water-to-resin ratio, but in injection areas with high water flow, it can be pumped without water. **800-877-2570; www.avantigrout.com.**

Prime Resins PR10

PR10 acrylamide from **Prime Resins** is a low-viscosity permeation chemical grout that is injected from within the manhole, wicking into the soil outside or used to curtain grout the exterior. A high-pressure pump injects grout through the manhole wall into the surrounding soil or is injected directly into the surrounding soil, creating an impermeable barrier. The permeation grout doesn't expand, but rather saturates the soil immediately outside of the manhole (with a desired gel time) that permanently stabilizes the soil and prevents further groundwater penetration. **800-321-7212; www.primeresins.com.**



Infrastructure Repair Systems Infragard



Neopoxy International
NPR-5305 One-Step Kit



CCI Pipeline Systems WrapidSeal
Manhole Encapsulation System



Picote Solutions Dual-Color
Epoxy Brush Coating System



Parson Environmental Products high-
density polyethylene manhole inserts

EPOXIES

Infrastructure Repair Systems Infragard

Infragard concrete and manhole rehabilitation products from **Infrastructure Repair Systems** include Top Coat and Chim-Coat, which are nonhazardous ambient cure epoxy systems for a small patch, entire manhole or retaining wall. This cost-effective solution requires no expensive equipment, as it has an easy trowel-on application. They are corrosion-resistant and high-strength, with an impermeable structural bond to the substrate or to almost any concrete or metal surface. Chim-Coat is engineered with a flexible feature that maintains adhesion while expanding or contracting with changing temperatures and traffic loads. **877-327-4216; www.irs.net.**

Neopoxy International NPR-5305 One-Step Kits

The single package, 1.5- or 3-gallon **NPR-5305 One-Step Kits** from **Neopoxy International** makes epoxy protective lining an easy, one-step mixing process. Both components are in a single container that allows the applicator to simply mix the product with a mixing blade until a nice, smooth color is evident. The product can then be moved to a vertical or horizontal surface to be lined, and smoothed with a plastic spatula. It doesn't require expensive spray equipment, is environmentally safe, requires no measuring and is easy to use. The 3-gallon kit covers 35 square feet at 125 mils. It can be used to fill and protect cracks, joints, and exposed aggregates and also perform CIPP repair, CIPP end seal, and manhole and pipe lining. **510-782-1290; www.neopoxy.us.**

Picote Solutions Dual-Color Epoxy Brush Coating System

The **Dual-Color Epoxy Brush Coating System** from **Picote Solutions** allows technicians to rehabilitate pipes from 1.25 to 12 inches for drains, sewers, water pipes, electrical conduits, and heat and air-conditioning ducts by brush casting a coating. The coating resin forms a pipe inside the original pipe that is a tested, safe and environmentally friendly product. The new pipe is damp-

proof, corrosion-resistant, wear-resistant and noncorrosive. It is ASTM and NSF certified (NSF/ANSI 61-5). It is a 100% solids epoxy, and the method allows for clear visual verification during the application process. Apply to small areas or all drains in multistory buildings. The system is practical and easily fits in tight places. **219-440-1404; www.picotesolutions.com.**

INSERTS

Parson Environmental Products high-density polyethylene manhole inserts

High-density polyethylene manhole inserts from **Parson Environmental Products** can help eliminate surface water inflow along with unwanted hydrogen sulfide odors and are easy to use and maintain. They include a vented PVC canister that stores 20 pounds of either activated or catalytic carbon. The result is a product that traps and stores all of the unpleasant hydrogen sulfide and methyl mercaptan odor molecules before they are released into the atmosphere. The only item that needs to be replaced periodically is the 20 pounds of carbon since it serves as the absorbent media that traps the odor molecules. One person can easily accomplish this. **800-356-9023; www.parsonenvironmental.com.**

MANHOLE LINERS

CCI Pipeline Systems WrapidSeal Manhole Encapsulation System

The **WrapidSeal Manhole Encapsulation System** from **CCI Pipeline Systems** consists of an engineered primer and a wraparound, heat-shrinkable sleeve designed to seal joints and prevent groundwater from entering a collections system. This material has a high shrink membrane (70% stretch and 40% recovery) designed to shrink around any manhole profile. In addition, the high tensile strength accommodates structural movement, while the tough backing resists soil stress and provides suitable abrasion resistance. It can be used for new construction or for the rehabilitation of existing manholes to control infiltration through joints and prevent deterioration, thus eliminating costly maintenance repairs and the added expense of treating groundwater. **800-867-2772; www.wrapidseal.com.**

(continued)



LMK Technologies CIPMH



Sauereisen Manhole ChimneySeal F-88



The Strong Co. Strong-Seal High Performance Mix



Kistner Concrete Products precast sanitary manholes

LMK Technologies CIPMH

The **CIPMH** (cured-in-place manhole) solution from **LMK Technologies** is a one-piece, resin-saturated liner designed to reduce inflow and infiltration and renew structural defects in a variety of manhole configurations and sizes, including barrel sections, as well as eccentric and concentric cones constructed of brick and mortar, precast or cinder block. This one-size-fits-most, reinforced and stretchable liner is engineered to resist traffic loading and freeze-thaw cycles while creating a corrosion-resistant lining. Available for chimney or full-depth manhole rehabilitation projects, the ASTM F3033-compliant, vacuum-impregnated liner is pressed against the existing manhole by a pressurized bladder until the thermoset resins have cured ambiently, typically within two hours. **815-433-1275; www.lmktechnologies.com.**

Sauereisen Manhole ChimneySeal F-88

Manhole ChimneySeal F-88 from **Sauereisen** is a chemically resistant, elastomeric lining composed of asphalt-modified urethane. Its fiber reinforcement provides durability, especially with respect to flexural forces. It is formulated to withstand the harsh environment that exists in the chimney sections of manholes, which are regularly exposed to acids, salts and alkalis along with broad temperature ranges and movement due to freeze-thaw cycles or ground shifting. It is a self-priming product easily applied with a gloved hand. It is also solvent-free, making it environmentally friendly. It bonds to steel, brick and concrete, allowing it to seal voids between metal castings, brick, sections of precast concrete or even the entire surface of a manhole chimney. Its elongation allows movement of the chimney section while retaining suitable water-stop capabilities. **412-963-0303; www.sauereisen.com.**

The Strong Co. Strong-Seal High Performance Mix

Strong-Seal High Performance Mix from **The Strong Co.** is a pure-fused calcium aluminate mortar that stops infiltration, restores structural integrity and protects against microbiologically induced corrosion in sanitary sewer systems with harsh sulfide conditions (pH greater than 1.0). As the pH level of the structure evolves downward, this product regulates microbial activity, providing corrosion protection. It is reinforced with alkaline-resistant fiberglass. When spray applied to a minimum 1/2-inch thickness, it is intended to form a structural monolithic liner covering all interior substrate surfaces. When correctly applied, this material exceeds the compressive and flexural strength of the original structure. **800-982-8009; www.strongseal.com.**

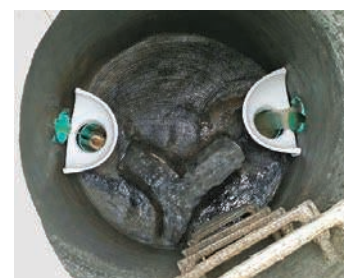
MANHOLE PARTS AND COMPONENTS

Kistner Concrete Products precast sanitary manholes

Precast sanitary manholes from **Kistner Concrete Products** are manufactured in sizes ranging from 48 to 144 inches I.D., or as needed. A properly



Pollardwater Prime Ultra-Grease Block



RELINER/Duran Inside Drop Bowls

designed and installed precast concrete manhole system provides suitable watertight performance and provides a long-term solution. They have watertight pipe-to-manhole boot seals for sanitary applications. The use of gaskets between sections per ASTM C443 allows for a tight connection between manhole sections. Structural and watertightness quality assurance/quality control testing as well as vacuum testing is performed to verify the highest level of confidence that the products are manufactured correctly and to specification. **716-508-5594; www.kistner.com.**

Pollardwater Prime Ultra-Grease Block

The **Pollardwater Prime Ultra-Grease Block** is filled with bacteria that, when lowered into grease-filled manholes, slowly and continuously dissolves and digests grease in lift stations and wet wells. In addition to combatting the costs of major grease disposal, it also offers timesaving benefits thanks to its easy-to-use design. Simply use the included hanging rope to lower the block into contaminated water and let it sit across from high-flow areas where it dissolves over 30 to 90 days. This product is available in three weights, from as little as 5 pounds for lesser amounts of grease to as much as 30 pounds for higher, more detrimental grease problems. **800-437-1146; www.pollardwater.com.**

RELINER/Duran Inside Drop Bowls

Eliminate troublesome outside drops and clean up failed inside drops. **RELINER/Duran Inside Drop Bowls** and stainless steel pipe support brackets simply bolt to the manhole wall and can be cleaned and inspected from above. The compact, low-profile bowls are available in dozens of sizes to fit any application. Modular Manhole Invert Channels improve manhole hydraulics, reducing maintenance, turbulence and odor. **800-508-6001; www.reliner.com.**

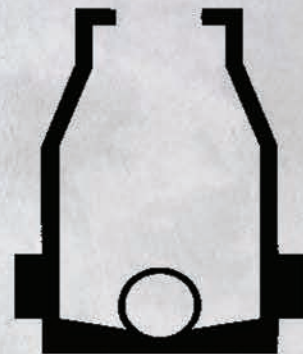
RootX chemical root control

Chemical root control from **RootX** is a long-term solution to pipeline root intrusion. It stunts new root growth without damaging the pipe, clear-

(continued)

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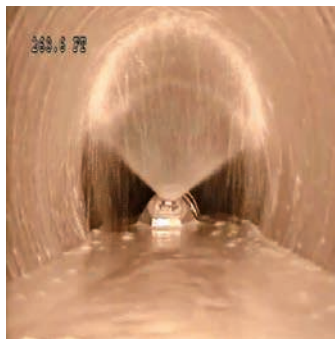


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ing pipeline roots that can cause blockages and sanitary sewer overflows. The chemical won't harm water treatment systems and is registered with the U.S. EPA for both sanitary and storm use (EPA Reg. No. 68464). Simplicity of application enables crews to perform root control on demand or as scheduled preventive maintenance. **800-844-4974; www.rootx.com.**

RISER

Cretex Specialty Products PRO-RING

The **PRO-RING** concrete-alternative manhole and catch basin grade adjustment system from **Cretex Specialty Products** is available in round, square and rectangular shapes. They are manufactured from expanded polypropylene, which is known for an exceptional strength-to-weight ratio, durability, chemical resistance and long service life under harsh conditions. One man can install the system in just minutes to within a quarter inch of finished grade, and they are watertight. A 6-inch system weighs just 14 pounds and stands up to all kinds of physical abuse. The system can dramatically speed manhole installation and repair time, allowing sites to be opened, repaired and closed in one day, reducing overall costs from 20% to 30% based on conditions. Angle rings are available to match slopes, eliminating the need for mortar and shimming. **800-345-3764 or www.cretexseals.com.**

SAFETY EQUIPMENT

McGard DuraShield

The **DuraShield** from **McGard** is a strong and durable security solution to prevent unauthorized manhole access. Constructed of stainless steel with multiple security points, it is lightweight and easy to handle and transport.



Mr. Manhole Platinum Series
Six Shooter



Inflow Seal manhole cover seal

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Mr. Manhole Platinum Series Six Shooter

The **Platinum Series Six Shooter** manhole cutter from **Mr. Manhole** is designed to make every aspect of the process — cutting, removal and repair process — smarter, faster and safer for crews. It has a heavier mainframe, new Easy-Drive System, and a larger cutting depth and diameter so it is able to complete high-volume repairs quickly and easily. The Six Shooter cuts diameters up to 72 inches and cuts 16 or 20 inches deep with optional blades. In addition to manhole frames, it can also cut out water valves and make road penetrations to repair utilities using the optional Cookie Cutter Package. Tie-down points on each arm make securing for transport easy and fast. **419-741-9075; www.mrmanhole.com.**

SEALANTS

Inflow Seal manhole cover seal

The manhole cover seal process from **Inflow Seal** is dependent upon the weight of the cover and a clean seat on the frame. If debris enters this seat, the cover is lifted, creating a gap and allowing surface water to flow at often more than 30 gpm into the manhole. Manhole cover gaskets, bolt down covers, or dishes can help, but they are still dependent upon a clean seat. Manhole covers are heavy, and every time you remove and install the cover, you bring debris into the frame seat. A solution is to install a vertical seal on the frame that seals out the inflow and up to 3/8 inch of debris in the frame seat. **800-490-5325; www.inflowseal.com.**

Sealing Systems Flex-Seal Utility Sealant

Flex-Seal Utility Sealant from **Sealing Systems** is a plural component aromatic urethane with an 800 percent elongation and a tensile strength of 3,200 psi. It is designed to prevent inflow/infiltration and to provide corrosion protection at the grade adjustment ring section or joint section. It provides an ideal seal and it will pass a vacuum test according to ASTM standards. **800-478-2054; www.ssisealingsystems.com.** ♦

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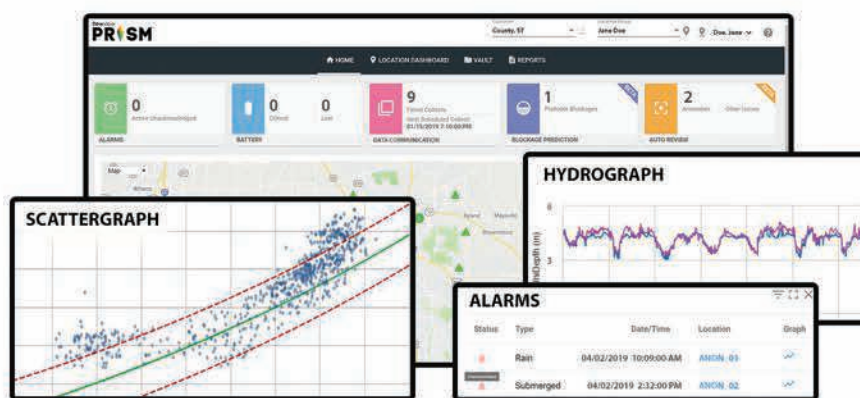
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Risers keep manholes at grade in heavy hurricane area

Problem:

Fairhope is a small city of just 15,000 residents situated on the cliffs and shoreline of Mobile Bay in Alabama's Gulf Coast. Infrastructure maintenance can be a challenge here for all the usual reasons and one unusual one: The city has a history of devastation and flooding by hurricane, including Hurricane Frederic in 1979 and Hurricane Katrina in 2005. But the city doesn't have a problem keeping manholes at grade after roadway resurfacing projects, not in recent years anyway.

Solution:

For 15 years, Fairhope has been specifying the **American Highway Products Pivoted Turnbuckle Manhole Riser**. The risers are sturdy, flexible rings made of galvanized steel, and they can be ordered in precise diameters to match any manhole and in precise thicknesses (with increments as fine as a quarter inch) to precisely match paving lifts. The "pivoting turnbuckle" is an adjustable linkage that allows the risers to be set loosely in an original utility rim, then expanded with a Phillips screwdriver (used as a lever) to seat tightly and securely.



RESULT:

At-grade risers are better for roads in many ways, compared to concrete ring replacement. They don't set low, so water doesn't collect around the manhole lid causing excessive infiltration; and they don't set high, so vehicle tires don't jar the lid and rim continually. And since risers are usually set just before paving runs, the newly raised manhole is surrounded by new, contiguous pavement, and that prevents water and freeze-thaw damage in the pavement around the manhole. 888-272-2397; www.ahpl.com.

City chooses centrifugally cast option to rehab manholes

Problem:

The city of Hampton, Virginia, has a collections system that dates back to the early 1940s, and nearly 75% of the system is below the groundwater table. During a rain event of 1 inch or more, groundwater and rain-derived



inflow and infiltration greatly overtaxes the system's capacity. In addition, I&I contributes to the wear and erosion of pipes and manholes and increases pumping and treatment costs.

Solution:

After careful consideration, Hampton selected the **Permacast** self-install solution from **AP/M Permaform**. The system centrifugally compacts high-strength, fine-aggregate concrete on the prepared interior of a deteriorated manhole. The crew also reestablishes the bench and inverts and installs a plastic manhole insert to stop the inflow. The bidirectional spincaster is raised and lowered with a winch to achieve thorough coverage and complete compaction without having to trowel.

RESULT:

Using the flow data and similar rain events to analyze the results, the efforts reduced inflow by 18% in their initial pilot program. The city subsequently implemented a full I&I reduction program, with a goal to rehabilitate 100% of the city's 11,000 manholes. A three-person crew now structurally lines about 400 manholes each season between April and October. The crew averages between three and four manhole rehabs each day, depending on depth, condition and access. 800-662-6465; www.permaform.net.

Lining system used to rehab manholes damaged by roots

Problem:

Deterioration caused by high water infiltration and severe root intrusion led to the need for rehabilitation of several wastewater manholes located in the town of Avon, Connecticut. Savy & Sons were contracted to restore the 4-by-11-foot redbrick chimney seals of these concrete manholes.



Solution:

Active water leaks were addressed by injecting a polyurethane hydro-active grout and coating with **CLADSTOP 1** from **CLADLINER**. Due to the low surface temperature of 20 degrees F, Savy & Sons heated the surface to 80 degrees F using an alternative heat supply. CLADSTOP 1 is designed for structural patching and for use as a leak stopper and water plug.

CLADSEAL was applied using a hand trowel to seal and protect the substrate. CLADSEAL is an elastomeric manhole chimney sealer and has maximum elongation and tensile strength, as an advanced urethane-acrylate 100% solids, epoxy hybrid. Once cured, the material is categorized as a hybrid flexible elastomer exhibiting high tensile elongation. It has the properties of traditional urethanes without the isocyanates and boasts a long shelf life.

(continued)

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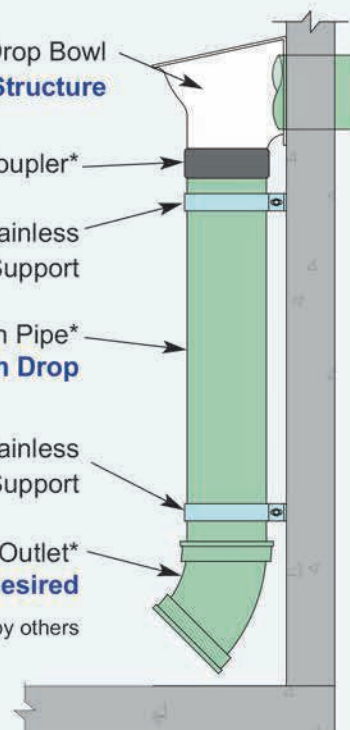
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RESULT:

From the start of this series of repairs in December 2018 continuing through January 2019, Savy & Sons addressed each manhole individually. “This awesome product was just right for the job,” says Travis Savy, company owner. “CLADLINER’s customer service is outstanding, and the products are amazing and of great quality. There is no comparison.” **877-708-2523; www.cladliner.com.**

Root control foam solves sanitary sewer overflows

Problem:

The West Bay Sanitary District in California had an excessive number of sanitary sewer overflows prior to 2010. They determined that 90% were root-related.

Solution:

Duke’s Root Control was brought in initially to apply its **Razorooter II** foam to a neighborhood that was notorious for root stoppages, averaging 14 overflows a year. The whole system includes 210 linear miles, all of which has been fully inspected via CCTV. The database is queried to locate root problems, and those pipes with issues are added to the program. Duke’s Root Control crews are contracted to apply the foam application, which allows West Bay’s crews to continue assessing pipes, perform in-house spot repairs and clean hot spots.



RESULT:

The following year, there were zero overflows in the neighborhood, and zero for several years after that. West Bay is now foaming 195,000 feet a year. “Duke’s Root Control program has been an integral part in reducing our SSOs,” says Serio Ramirez, West Bay Sanitary District operations superintendent. “It is one of the primary reasons we have gone from having 49 SSOs in 2009 to only four in 2018, where two out of the four were contractor discharges of water and mud.” **800-447-6687; www.dukes.com.**

Access assemblies help a town prevent I&I issues and improve safety

Problem:

The town of Cary, North Carolina, has dozens of streams and lakes located in its boundaries, and it is prone to occasional flooding. During major rain events, stormwater occasionally gets into the sanitary system, causing sewage backups that can overflow from manholes into nearby lakes. When sewage infiltrates creeks and lakes, fish and wildlife are endangered

and the town must deal with the resulting cleanup and potential fines. They needed to find a better solution. After trying elevated manhole covers, they discovered that the covers would pop off when stressed.

Solution:

EJ provided the **REVOLUTION Access Assembly**, an elevated manhole cover that required no lifting. Once the bolts are removed, workers can easily rotate the lightweight cover away from the opening to access the manhole. It stays attached to the frame via a cast-in stainless steel rod. One worker can easily access the elevated manholes. It also seals tightly when closed, preventing I&I.



RESULT:

“When the lid is seated correctly, the **REVOLUTION** works great for preventing any type of inflow, pretty much across the board, everywhere we’ve installed it,” says Robert Hirt, P.E., utility engineering supervisor for the town of Cary. A backup along the Walnut Creek sewer outfall, following Hurricane Matthew in 2016, proved that point without a doubt. **800-626-4653; www.ejco.com.**

Liner system helps Florida coastal city with I&I issues

Problem:

Fernandina Beach, Florida, is situated on the shores of the Atlantic Ocean to the east and the Intracoastal Waterway to the west and receives an average annual rainfall of 51 inches. Consequently, the groundwater table is extremely high. Its principal sewer treatment plant is permitted for 2.5 mgd.

The sanitary sewer system is older, with approximately 95 miles of gravity sewer, force mains and 1,461 manholes. The system’s infiltration problem became so acute that plans were being evaluated for a treatment plant expansion expected to cost in excess of \$20 million.

Solution:

Beginning in 2005, John Mandrick, Fernandina Beach utilities director, began a phased I&I reduction program using the **SpectraShield Liner Systems** for manhole rehabilitation and CIPP. It is a multilayered lining system designed to stop infiltration and prevent corrosion.



(continued)



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Smart Crawler Inspection System

FB215



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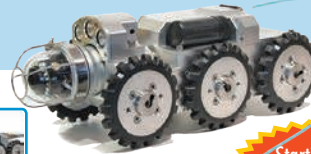


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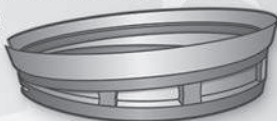
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CASE STUDIES MANHOLE EQUIPMENT AND REHABILITATION

RESULT:

By 2014, flows had been reduced by 800,000 to 1 mgd. A major plant expansion was avoided, operating costs were reduced, energy savings were realized and groundwater was conserved. The Environmental Protection Agency estimated the reduction in flow reduced operating costs by more than \$450,000 per year. The energy savings from the reduced flow volume is in excess of 200,000 kWh per year. Groundwater is now percolating into the local groundwater table and not the treatment plant. **800-284-2030; www.spectrashield.com.**

Chimney seals prevent I&I in new manholes

Problem:

During the construction of a new subdivision near Louisville, Kentucky, the specification on new manholes stated that all had to be vacuum tested after construction. Upon passing the vacuum test, an internal mechanical chimney seal had to be installed to prevent future I&I into the sewer system, thus preventing costly treatment of unnecessary water.



Solution:

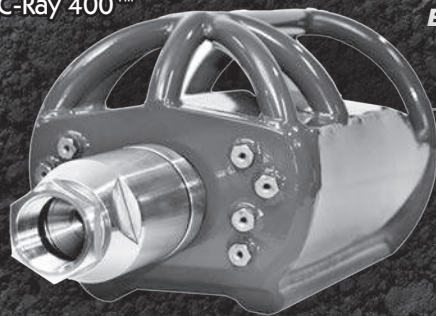
The project was awarded to Tru Test and included the installation of more than 50 internal manhole seals. Dave Conrad of Tru Test had used **Trelleborg Pipe Seals' DrainFlexRib Manhole Chimney Seals** for several years. The solution consists of an EPDM seal, which has a rib design that allows vertical and lateral movement, while still ensuring a watertight seal. The waveband technology creates a more effective seal by concentrating the compressive force of the expansion band, effectively capturing the rubber between the band and the concrete. The chimney seals were installed before the contractor had finished the final asphalt road surfacing. After completion of the road grading, Tru Test went back to check the installation. This was less than two weeks after the manholes had passed the initial vacuum test.

RESULT:

The top retaining band of the Trelleborg DrainFlexRib seal was already performing. It held back water that had leaked through the failed mastic and concrete grouting that the manhole contractor had used to help pass the vacuum test. Without the installation of the chimney seals, the newly installed manholes would already be leaking two weeks after construction. Instead, an immediate impact on I&I was achieved. **800-626-2180; www.trelleborg.com/pipe-seals.** ♦

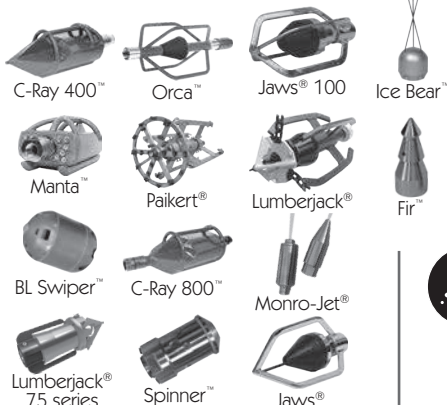
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Randall Dellaposta, Director of Equipment and Facilities at the Genesee County Road Commission (GCRC)



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Product Spotlight

Vacall packs power in efficient jetting truck

By Craig Mandli

When it comes to municipal work, efficiency is the name of the game. With budget-consciousness and profitability in mind, Vacall recently introduced the AllJet truck-mounted jetter, designed by Gradall Industries to provide municipalities and contractors with a highly efficient, easy-to-operate sewer cleaning machine.

With standard Vacall “Green That Works” advantages, the AllJet uses a fuel-saving single-engine PTO design, a 1,600-gallon UV-resistant polyethylene water tank and an AllSmartFlow CANbus control system. AllSmartFlow controls, protected inside a weather-resistant cabinet, help optimize operating efficiency with controls for water pump speed and pressure, hose reel adjustment, chassis engine and more. New operators can quickly learn to operate the powerful jetting action, while precision monitoring can make sure the AllJet is delivering optimum on-the-job performance. Over the road and around the work site, a full enclosure protects the AllSmartFlow control panel, eliminating the chance of damage to joysticks and levers that stick out on other machines.

The hydraulically powered triplex plunger water pump is capable of 87 gpm at 2,000 psi, enough power to effectively jet blockages in sewer lines and routinely maintain flow, with other power options available. The hose

reel telescopes out 54 inches from a retracted position and swivels 200 degrees, locking into position for productive working angles while properly directing the 600-foot, 1-inch-diameter jetting hose.

The water tank is constructed with UV-resistant black polypropylene and internally baffled with a filling system that runs through the tank, eliminating external plumbing. Operator-friendly features include four locking aluminum tool storage cabinets, a rearview camera, three roll-up doors, a washdown system and a number of options including LED lighting packages, an extendable rear canopy, and a 13,650 Btu/h heater and insulation package to warm the rear compartment, protecting pumps, hoses and plumbing from freezing, which enables year-round use in cold climates.

Designed for simplified operation to speed up emergency response to sewer line blockages, the AllJet chassis engine also operates the powerful jetting function, reducing fuel costs, emissions and maintenance associated with two-engine sewer cleaners. 800-382-8302; www.vacall.com.



Perma-Liner Industries Manhole Edge Protector

The Manhole Edge Protector from Perma-Liner Industries is made in highly visible safety orange, which helps identify the site and the open manhole, eliminating potential hazards. The 360-degree edge protection also eliminates the top-edge roller and top-wide tiger tail that can allow the cable to slip off the roller. The interior 3.5-inch flange holds back debris and any loose infrastructure from falling into the manhole. It is made with ABS 3/16 plastic, which is durable and withstands temperatures from 40 degrees below zero to 180 degrees F. The Manhole Edge Protector leaves the manhole completely open, providing accessibility and visibility while also protecting the camera and jetter lines. 866-336-2568; www.perma-liner.com.



Sewer Equipment GENESIS water recycling sewer cleaner

The GENESIS water recycling sewer cleaner from Cappellotto by Sewer Equipment employs a passive separation approach, which includes a true five-stage separation process. Using gravity, it separates water from sludge.

The GENESIS is able to work effectively and efficiently in grease and lines containing water with any size impurities, as there are no filters to become clogged. It has a 13-yard stainless steel debris tank, a 1,500-gallon stainless steel water tank, a 90 gpm at 2,500 psi water pump designed specifically for recycled water, a positive displacement blower with 3,000 cfm at 27-inch Hg with 6-inch system, and 800 feet of 1-inch sewer hose. With a boom reach that is adjustable from 15 to 21 feet from the center of the truck, the Smart Boom assembly has 65 feet of vacuum tube, providing the ability to vacuum 30 to 37 feet below grade without adding additional tubes. 800-323-1604; www.sewerequipment.com.



HammerHead Trenchless WT212-3D wet-out table

The WT212-3D wet-out table from HammerHead Trenchless features a three-drive roller system and no-shim gap control that combine to deliver accurate and uniform resin saturation for CIPP installations. The three-drive design powers rollers to reduce liner





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wrinkling; and a quick-locking gap mechanism allows users to calibrate gaps between 0.19 and 0.59 inches to eliminate thickness variation in resin. Other features include a safety e-stop that halts movement and also releases roller pressure for easier removal of anything between the rollers. A self-centering belt eliminates in-field adjustment and reduces wear and tear. **800-331-6653; www.hammerheadtrenchless.com.**

Myers Seth Pump DD-6 pump

The DD-6 pump from Myers Seth Pump pulls the best attributes of four different types of pumps — double diaphragm, centrifugal, piston and rotary lobe — into one solution. The DD-6 is capable of being used for the six most common methods of dewatering that are typically encountered on a job site, from simple to complex. The 6-inch, high-volume, double-diaphragm pump has a HATZ 1D81Z, 10 hp air-cooled diesel engine, enabling 140 max cfm. It features high head pressure and 3/8-inch steel construction to make it reliable and durable. It can pump 700 gpm, deliver 28 feet of vertical lift and move 4 1/2-inch solids, making it a great sludge and slurry pump as well. The Sound Attenuated Fully Enclosed version reduces noise output by up to 50%, making it ideal for metropolitan and urban environments. **904-389-6114; www.myerssethpumps.com.**



Schonstedt Instrument Loki locator for large areas

Schonstedt Instrument's Loki is a multifrequency locator solution designed to sweep large areas to quickly and easily locate buried assets. With Dual

Mode capabilities, the Loki can simultaneously search for and identify transmitter and power signals for quick and accurate sweeps prior to excavation. Available in two models, Contractor and Utilities, the locator operates in Active, Inductive, Sonde and Passive modes. The ShallowAlert warns of shallow pipes and cables, and NoiseProtect enables use in electrically noisy environments. Each model is optimized to perform in the demanding environments of the construction and utilities industries. **888-367-7014; www.schonstedt.com.**



Sensoray high-definition embeddable digital video recorder Model 4023

The Model 4023 from Sensoray is a compact high-definition digital video recorder designed for embedded OEM applications. It captures and records analog HD video (TVI, CVI, AHD) and stereo audio to USB storage media and can capture JPG images on the fly without interrupting stream recording. It provides both DVI and composite NTSC/PAL outputs to allow live or recorded video and JPG snapshots to be displayed on an external HD or SD monitor. Date and time are maintained by a real-time clock with battery backup. To implement a complete embedded DVR, connect power, a keypad or keyboard, and a USB storage device. A wireless DVR can be created by plugging a USB Wi-Fi adapter into one of the USB ports. **503-684-8005; www.sensoray.com. ♦**



Gradall Industries releases video featuring production, models and history

Gradall Industries released a new video providing an in-depth look at its Vacall family of products, including an up-close tour of Gradall's New Philadelphia, Ohio, manufacturing facilities. The 12-minute video features the manufacturing processes that produce Vacall sewer cleaning, hydroexcavation, industrial vacuum and sweeper models. The video also includes a brief overview of the history of the Vacall models and a summary of the various AllJetVac, AllExcavate, AllSweep and AllVac machines, as well as Vacall's new AllJet truck-mounted jetting machine. To view, visit www.vacall.com/vacall-tv.php.

Milliken Infrastructure Solutions announces new website

Milliken Infrastructure Solutions announced the launch of a new website with the intent of improving user experience. Changes were made to make it easier to navigate to find resources and information based on product, industry or resource preference. The company partnered with a developer to create a solutions finder tool, which allows the user to find a Milliken Infrastructure Solutions product solution based on general to specific infrastructure issues commonly found in each industry.

Avanti International announces pathway to Certified Grout Technician

Starting in April 2019, the first Grouting Certified Technician course offering will be conducted at Avanti International's headquarters in Webster, Texas. The course will certify competence in knowledge of solution grouts, application of best practices to seal the collections system from infiltration of groundwater and exfiltration of sewerage, and stabilization of the sewer trench from further erosion of supporting soils. The two-day course titled Advanced Insitu Grout Chemistry & Best Practices — also known as Level 300 — provides grout technicians with both classroom and hands-on lab experiences to better equip them for decision-making in response to variable conditions such as soil types, temperature extremes and presence of groundwater.

Jetstream of Houston enters distribution partnership with Diamond Technology Innovations

Jetstream of Houston announced an exclusive distribution partnership in the professional cleaning, surface prep and waterblasting industry with Diamond Technology Innovations, a manufacturer of water jet nozzles, cutting heads and related products. Under the terms of the 18-month agreement, Jetstream of Houston will sell and support Diamond Technology Innovations' tetraCORE nozzle. Designed for use in a variety of high-pressure water jet cleaning and surface prep applications, tetraCORE nozzles produce a coherent jet stream that does not widen over use, ensuring consistent flow rates and optimal energy directed at the target areas for the entire life of the orifice.

Franklin Electric welcomes new sales leader

Franklin Electric welcomed Ryan Johnson as the new vice president of sales in the U.S. and Canada for the North America Water Systems Business Unit. He will manage all aspects of sales activities for the U.S. and Canadian markets. Johnson has 20 years' industry experience in



Ryan Johnson

motors, sales and management, spending his entire career with Regal Beloit and General Electric. His background includes expertise in marketing, Six Sigma, operations and in every aspect of the sales process, from direct field sales experience to sales management leadership.

InfoSense a registered vendor for SAM

InfoSense is now a registered vendor for the Navy Electronic Commerce Online, FedBid/Unison and FedBizOpps through the System for Award Management and Department of Defense. This will help streamline the procurement management process for federal government entities interested in utilizing acoustic inspection technology for their sewer collections system maintenance program.

SmartCover Systems announces new regional sales manager

SmartCover Systems announced the appointment of Josh Grimes as regional sales manager for its central region. He is based in Austin, Texas, and will be responsible for managing all SmartCover Systems business in the central U.S., including managing relationships with business partners and distributors.



Bucher Municipal Center of Excellence

Bucher Municipal opens service center in California

Located in Ontario, California, the Bucher Municipal Center of Excellence held its grand opening in May. The full-service location will offer a range of upscale amenities to service all Bucher Municipal products. In addition to traditional service products, the center will also offer training, demonstration and showroom facilities, as well as spare parts and accessories.

CUES opens new sales and service center

CUES announced the grand opening of its newest sales and service center in New Castle, Delaware, just off the Interstate 95 corridor. The fully staffed and factory-certified center will provide CUES customers with direct access to customer service, loaner equipment support and new equipment sales. The new location features over 8,100 square feet of offices, inventory, shop and service space.

Felling Trailers wins Sourcwell contract for heavy equipment trailers

Felling Trailers was awarded a national cooperative contract for heavy equipment trailers through Sourcwell (formerly NJPA). Felling Trailers' Sourcwell contract is effective through February 2023 and provides access to the following types of goods and services: utility, construction, agricultural, drop-deck, deck-over and hydraulic dump trailers. It also covers pole/reel/coil, generator/compressor and tender-frame and sprayer-chopper trailers. ♦

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W&T Contracting Corporation has immediate openings for certified CCTV Operators to provide NASSCO Certified Inspections for projects in the Memphis, TN area. The core requirements are as follows: • NASSCO Certifications: Pipeline Assessment (PACP), Manhole Assessment (MACP), Lateral Assessment (LACP) Certification Programs • Must be able to pass work physical, drug test and background check • Must be at least 21 yrs. old • Obtain CDL Class B license a plus. This is a "hands-on", highly visible, full-time position with potential for advancement and a competitive compensation package that offers an excellent benefits package that includes medical, dental, vision, 401K. Contact Wiley Richards 901-497-1291; wileyrichards@msn.com (M06)

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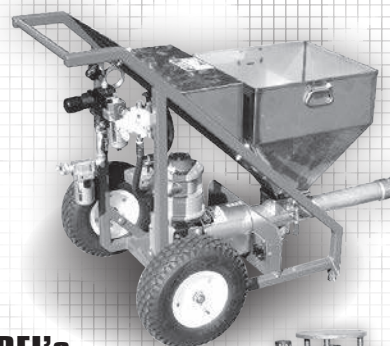
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PEOPLE/AWARDS

Erik Michelsen, administrator of the Anne Arundel County (Maryland) Watershed Protection and Restoration Program, received the inaugural Ron Bowen Environmental Legacy Award from the Anne Arundel County Watershed Stewards Academy. The honor is named for Ron Bowen, the former director of the Anne Arundel County Department of Public Works and co-founder of the Watershed Stewards Academy. The award honors someone who exemplifies visionary leadership and fosters environmental action through connecting government and private resources.

The New York Water Environment Association presented its Nelson A. Rockefeller Award for environmental leadership to Buffalo **Mayor Byron W. Brown**. The award goes to elected officials who have made substantial and meaningful contributions to advancing effective environmental programs. Brown earned the award because of his leadership on numerous environmental initiatives around Buffalo, the organization says. The initiatives include the Rain Check program, which aims to reduce stormwater runoff.

The **town of Canton** (North Carolina) received the Big Creek Award for Partner of the Year from the Haywood Waterways Association. Among the activities in which it participates, Canton is active in the WNC Stormwater Partnership.

The **Orange County (California) Water District's Mid-Basin Injection: Centennial Park project** received the Water Treatment Project of the Year Award from the American Society of Civil Engineers-Orange County Branch. The \$29.5 million project is in the city of Santa Ana and is scheduled to be completed in fall 2019. Among the project's benefits, it will free up storage space in the basin near Anaheim to recharge other sources of eventual drinking water, such as more imported water and stormwater, when available.

The **city of Vancouver** (Washington) is receiving more than \$7 million in grant money from the state's Department of Ecology for stormwater improvement projects and activities. The city uses local stormwater utility funds, provided by ratepayers, as matching contributions to acquire Department of Ecology grants.

Harris County (Texas) is receiving a \$320,000 federal grant to evaluate a flood protection strategy that involves building deep underground tunnels to move stormwater to the city's ship channel. The Harris County Flood Control District would use the grant money from the U.S. Economic Development Administration to study whether the tunnels would be a cost-effective option without overburdening the area's bayous. ♦

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CALENDAR

June 9-12

American Water Works Association ACE19 Annual Conference & Exposition, Denver. Visit www.awwa.org.

June 16-19

American Water Resources Association Summer Specialty Conference: Improving Water Infrastructure Through Resilient Adaptation, Nugget Casino Resort, Sparks, Nevada. Visit www.awra.org.

June 17-19

American Society of Civil Engineers International Conference on Computing in Civil Engineering, Georgia Institute of Technology, Atlanta. Visit www.asce.org.

July 7-10

American Society of Agricultural and Biological Engineers Annual International Meeting, Boston Marriott Copley Place, Boston. Visit www.asabe.org.

Aug. 18-22

StormCon 2019, Hyatt Regency hotel, Atlanta. Visit www.stormcon.com.

Sept. 8-11

American Public Works Association Public Works Expo (PWX), Washington State Convention Center, Seattle. Visit www.apwa.net.

Sept. 9-11

National Rural Water Association WaterPro Conference, Nashville, Tennessee. Visit www.nrwa.org.

Oct. 9-13

American Society of Civil Engineers Annual Conference, Miami. Visit www.asce.org.

Oct. 20-23

American Water Works Association Water Infrastructure Conference & Exposition, Hyatt Regency at The Arch hotel, St. Louis. Visit www.awwa.org.

Nov. 3-7

American Water Resources Association Annual Water Resources Conference, Sheraton Hotel, Salt Lake City. Visit www.awra.org.

Municipal Sewer & Water invites your national, state or local association to post notices and news items in this column. Send contributions to editor@mswmag.com.



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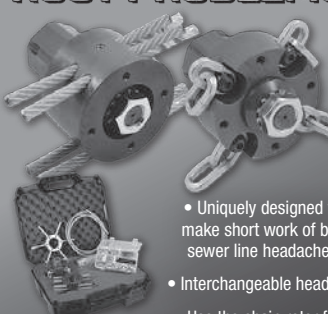


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